



19 July 2022

*Via Electronic Mail*

Ms. Katie Daugherty  
Oregon Department of Environmental Quality  
Northwest Region 28  
700 NE Multnomah St, Suite 600  
Portland, OR 97232

Reference: 0629640.102

Subject: Quarter 2, 2022, Progress Report  
(April through June 2022)  
Arkema Inc. Portland Plant

Dear Ms. Daugherty:

ERM-West, Inc. (ERM) is submitting this Quarterly Progress Report (QPR) on behalf of Legacy Site Services LLC (LSS) agent for Arkema Inc. (Arkema) to summarize Quarter 2, 2022, activities at the Arkema facility located at 6400 NW Front Avenue in Portland, Oregon.

Paragraph 8(G) of the Order on Consent Requiring Source Control Measures and Feasibility Study between the Oregon Department of Environmental Quality (ODEQ) and LSS, dated 31 October 2008, requires submittal of QPRs. The following progress report summarizes activities for Quarter 2, 2022 (April through June).

Weekly progress summaries for implementation of the stormwater and groundwater source control measures (SCM) have been developed over the duration of the project. The reports for Quarter 2, 2022, are included as Attachment 1 to this QPR for reference, and activities documented in the reports are not duplicated in this letter.

#### **Actions Taken Quarter 2, 2022 (April through June)**

- 5 April 2022: ERM, on behalf of LSS, submitted the Feasibility Study Functional Units Memo to the ODEQ.
- 12 April 2022: ERM, on behalf of LSS, shut down the groundwater extraction and treatment (GWET) system for sand filter maintenance. The ODEQ was notified of the shutdown, and the plant was restarted 12 April 2022.
- 13 April 2022: ERM, on behalf of LSS, submitted the 2021 GWET System Effectiveness Evaluation Report to the ODEQ.
- 18 April 2022: ERM, on behalf of LSS, submitted the February 2022 monthly Discharge Monitoring Report (DMR) for National Pollutant Discharge Elimination System (NPDES) permit compliance monitoring of the system.

- 18 April 2022: ERM, on behalf of LSS, submitted the January–March 2022 monthly supplemental effluent toxics data for NPDES permit renewal.
- 18 April 2022: ERM, on behalf of LSS, submitted the March 2022 monthly DMR for the performance monitoring of the stormwater SCM to the ODEQ.
- 19 April 2022: ERM, on behalf of LSS, shut down the GWET system due to high levels in tank T-3. The ODEQ was notified of the shutdown, and the plant was restarted 20 April 2022.
- 20 April 2022: ERM, on behalf of LSS, submitted the Quarter 4, 2021, Groundwater Monitoring Report to the ODEQ.
- 20 April 2022: ERM, on behalf of LSS, submitted the QPR for Quarter 1, 2022, to the ODEQ.
- 26 April 2022: ERM, on behalf of LSS, shut down the GWET system due to plate separator maintenance. The ODEQ was notified of the shutdown, and the plant was restarted 26 April 2022.
- 30 April 2022: ERM, on behalf of LSS, identified a GWET system shutdown due to a power outage. The ODEQ was notified of the shutdown, and the plant was restarted 30 April 2022.
- 12 May 2022: ERM, on behalf of LSS, submitted the Final Design Report to the ODEQ.
- 13 May 2022: ERM, on behalf of LSS, submitted the March 2022 monthly DMR for NPDES permit compliance monitoring of the GWET system.
- 13 May 2022: ERM on behalf of LSS, submitted the April 2022 monthly DMR for the performance monitoring of the stormwater SCM to the ODEQ.
- 13 May 2022: Representatives from ERM, on behalf of LSS, had a call with the ODEQ to discuss the stormwater permit additional data request.
- 16 May 2022: Representatives from ERM, on behalf of LSS, had a call with the ODEQ to discuss the Groundwater Extraction Enhancement (GEE) Trench Schedule and GWET Plant shutdown.
- 19 May 2022: ERM, on behalf of LSS, received comments from the ODEQ regarding the Feasibility Study Functional Units Memo.
- 20 May 2022: ERM, on behalf of LSS, shut down the GWET Plant and wellfield due to maintenance and upgrades in preparation for increased flows. The GWET Plant and wellfield are anticipated to restart in July after maintenance is completed. The ODEQ was notified of the shutdown.
- 3 June 2022: Representatives from ERM, on behalf of LSS, had a call with the ODEQ to discuss the Feasibility Study Functional Units and Technology Alternatives Screening Memo.
- 6 June 2022: ERM, on behalf of LSS, began the Quarter 2, 2022, groundwater monitoring event. The event was completed on 9 June 2022.
- 7 June 2022: ERM, on behalf of LSS, received comments from the ODEQ regarding the Final Design Report.
- 20 June 2022: ERM, on behalf of LSS, submitted the Quarter 1, 2022, Groundwater Monitoring Report to the ODEQ.

- 21 June 2022: ERM, on behalf of LSS, submitted the April 2022 monthly DMR for NPDES permit compliance monitoring of the GWET system.
- 21 June 2022: ERM, on behalf of LSS, submitted the May 2022 monthly DMR for the performance monitoring of the stormwater SCM to the ODEQ.

### **Actions Scheduled for Quarter 3, 2022 (July through September)**

- The QPR for Quarter 2, 2022, will be prepared and submitted.
- LSS will continue to monitor discharges from the stormwater SCM and submit monthly monitoring reports to the ODEQ.
- LSS will continue to monitor discharges from the groundwater SCM and submit monthly DMRs as well as monthly supplemental effluent toxics data to the ODEQ.
- LSS will continue optimization of the GWET system as part of the implementation of the groundwater SCM and in accordance with the GWET System Corrective Action Plan and associated updates.
- LSS will conduct routine maintenance on the stormwater SCM.
- LSS will continue to suspend monthly status reports until completion of the groundwater construction trenches consistent with the ODEQ's comments on the September 2021 Groundwater SCM MPR received 30 November 2021.
- LSS will submit the Quarterly Groundwater Monitoring Report for Quarter 2, 2022, to the ODEQ.
- LSS will conduct groundwater monitoring for Quarter 3, 2022.
- LSS will submit the Technology Alternatives Screening Memo.
- LSS will begin construction and implementation of the GEE system.

### **Summary of Validated Data**

- Weekly compliance and quarterly characterization sampling of the GWET system data were received and validated. These data were presented in the respective monthly DMRs.
- Quarter 1, 2022, groundwater monitoring event data were reviewed and validated during Quarter 2, 2022. These data are included in Attachment 2 and are presented in the Quarterly Monitoring Report for Quarter 1, 2022.
- Quarter 2, 2022, groundwater monitoring event data were collected. These data will be reviewed, validated, and presented in the Quarterly Groundwater Monitoring Report for Quarter 2, 2022.

### **Problems Experienced During Quarter**

Specific problems experienced during the GWET system optimization and operation are documented in the attached weekly progress reports. No other problems were experienced during Quarter 2, 2022.

**Closing**

If you have questions or comments pertaining to this progress report, please contact us at (503) 488-5282.

Sincerely,



Brendan A. Robinson, PE  
Partner



Sarah Seekins  
Project Manager

**Attachments**

cc: Todd Slater, LSS  
Hunter Young, USEPA  
Matt Stock, Joyce Ziker Parkinson

Lance Peterson, CDM  
Karen Traeger, LSS  
David Livermore, Integral

**ATTACHMENT 1   QUARTER 2, 2022, WEEKLY PROGRESS REPORTS**



**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 1 April 2022 to 7 April 2022**  
**Former Arkema Facility, Portland, Oregon**

**Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge proceeded continuously. Uptime for the reporting period was 100 percent. The average system influent flow rate was 9.9 gpm. Recovery wells RW-05 through RW-07, RW-10 through RW-12, RW-14, RW-15, RW-18 through RW-23, RW-25, and RW-26 were in operation during the reporting period.

Notable activities that occurred within the reporting period include the following:

- Friday, 1 April 2022: Operators performed general O&M and emptied filter press cake into a roll-off bin. Installed 3-inch piping at the sand filter reject effluent. Constructed uni-strut support for sand filter utilities. Ferralgas onsite and filled the leaking tagged-out propane tank, technician returned and unable to pump down the tank, PM notified.
- Saturday, 2 April 2022: Operator performed general O&M. Recalibrated transducer MWA-2. Tested/repairs COD machine.
- Sunday, 3 April 2022: Operator performed general O&M. Connected piping from tank T-12 to the sand filter influent and fittings to the reject pipe.
- Monday, 4 April 2022: Operators performed general O&M. Tidewater onsite to pick up two roll-off boxes of creosote timbers to be transported to Roosevelt Landfill for disposal. WD Nelson onsite and installed the handrails for the sand filter and kick plate and rung for the ladder. Operators installed 2-inch pipe at tank T-5 for cleaning the sand filter fines/solids during startup.
- Tuesday, 5 April 2022: Operators performed general O&M. Operators backwashed carbon vessel CT-2 to tank T-10. Collected sample of CT-2 backwash water for analysis of HPC.
- Wednesday, 6 April 2022: Operators performed general O&M. Operator started the auto-sampler for collection of the weekly NPDES compliance samples. Swapped out 1-HP pump at recovery well RW-23. Recalibrated transducer at RW-8.
- Thursday, 7 April 2022: Operators performed general O&M. Operator collected weekly NPDES compliance samples. Added 1,500 pounds of sand to sand filter. Operator utilized rental walk-behind mower to remove vegetation from the site.

**Inoperable Recovery Well Status**

- RW-08: Turned off due to lack of hydraulic productivity.
- RW-09: Off due to fouled pump.
- RW-13i: Off due to fouled pump.
- RW-16i: Off due to fouled pump.

- RW-24i: Off due to issues with flow meter not communicating with PLC. Additional troubleshooting is required.

**Sampling**

- HPC analysis for biological growth samples collected 5 April 2022.
- Weekly NPDES compliance samples collected on 7 April 2022.

**Stormwater**

- Stormwater samples collected on 7 April 2022.
- Weekly ISCO sampler inspection conducted.



**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 8 April 2022 to 14 April 2022**  
**Former Arkema Facility, Portland, Oregon**

**Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge proceeded continuously until a scheduled 20-minute shutdown to install wiring for the sand filter control box. Uptime for the reporting period was 99 percent. The average system influent flow rate was 11.4 gpm. Recovery wells RW-05 through RW-07, RW-10 through RW-12, RW-14, RW-15, RW-18 through RW-23, RW-25, and RW-26 were in operation during the reporting period.

Notable activities that occurred within the reporting period include the following:

- Friday, 8 April 2022: Operators performed general O&M. Transferred 1,500 pounds of sand to the sand filter. Cleared vegetation around the GWET building with walk behind mower. Installed the float switch for the sand filter. Installed 2-inch ball valve at sand filter and tank T-5 recirculate/drain.
- Saturday, 9 April 2022: Operator performed general O&M. Installed final guardrail for the catwalk.
- Sunday, 10 April 2022: Operator performed general O&M.
- Monday, 11 April 2022: Operators performed general O&M. Opened northside propane tank and turned heaters on in the GWET plant due to inclement weather. Cochran onsite and installed wires for the sand filter control panel to LP1. Transferred 1,500 pounds of sand to the sand filter.
- Tuesday, 12 April 2022: Operators performed general O&M, cleaned a 1-hp pump, and emptied filter press cake bins into a roll-off bin. Transferred 1,500 pounds of sand to the sand filter. Wasted tank T-7 into a dewatering box. Operators shut down wellfield for 20 minutes and LOTO power to LCP-1 for Cochran to complete the sand filter control box wiring.
- Wednesday, 13 April 2022: Operators performed general O&M and cycled the filter press. Operator started the auto-sampler for collection of the weekly NPDES compliance samples. Connected the sand filter control box to the air line. Mobilized to RW-22 in MCC-3 and performed LOTO to swap out the I/O card for malfunctioning transducer at PA-08, recalibrated transducer. Installed ½-inch pipe to air supply for the sand filter air lift. Completed transferring 30,000 pounds of sand to the sand filter.
- Thursday, 14 April 2022: Operators performed general O&M and housekeeping. Operator collected weekly NPDES compliance samples. Utilized the O2 generator to kill off biology in tanks T-9. Installed 4-inch backwash pipe and 6-inch pipe from the sand filter to tank T-5. Filled sand filter with water from tank T-6.

**Inoperable Recovery Well Status**

- RW-08: Off due to lack of hydraulic productivity.
- RW-09: Off due to fouled pump.



- RW-13i: Off due to fouled pump.
- RW-16i: Off due to fouled pump.
- RW-24i: Off due to issues with flow meter not communicating with PLC. Additional troubleshooting is required.

**Sampling**

- Weekly NPDES compliance samples collected on 14 April 2022.

**Stormwater**

- No stormwater samples collected this week.
- Weekly ISCO sampler inspection conducted.



**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 15 April 2022 to 21 April 2022**  
**Former Arkema Facility, Portland, Oregon**

**Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge proceeded continuously with the exception of an unexpected shutdown on 19 April resulting from high levels in tank T-3. Uptime for the reporting period was 92 percent. The average system influent flow rate was 9.0 gpm. Recovery wells RW-05 through RW-07, RW-10 through RW-12, RW-14, RW-15, RW-18 through RW-23, RW-25, and RW-26 were in operation during the reporting period.

Notable activities that occurred within the reporting period include the following:

- Friday, 15 April 2022: Operators performed general O&M. Constructed air manifold at the sand filter control panel. Conducted monthly water levels. Installed a tap at tank T-5 for tubing to the turbidity meter. Transferred water from tank T-6 to the sand filter and cycled water from the sand filter effluent to pre-treatment side tank T-8 to clean the sand.
- Saturday, 16 April 2022: Operators performed general O&M. Tank T-8 overflowed to the sump due to a backwash cycle, pump P-PS-4 failed to start and will be monitored.
- Sunday, 17 April 2022: Operators performed general O&M.
- Monday, 18 April 2022: Operators performed general O&M. Transferred water from the sand filter reject to the precipitate reactor via tank T-8. The reject water turbidity was at 100 NTU and 0.5 NTU at the plate separator. Transferred water from the sand filter effluent to tank T-10 via sump. Collected combined reject water and GWET influent water for TSS analysis. Collected carbon HPC samples.
- Tuesday, 19 April 2022: Operators performed general O&M. Operators backwashed carbon vessel CT-2 to tank T-10. Pushed forward flow from the FBR to the sand filter. Reject weir = 3 inches, reject overflow =  $\frac{3}{4}$  to 1 inch, air supply = 100 psi, air-lift SCFH = 30 psi. Cleaned the rental bag filter assembly. Repaired the pre-treatment side coagulant tubing. Cleaned weirs on the plate separator. Well-field shutdown due to high levels in tank T-3.
- Wednesday, 20 April 2022: Operators performed general O&M and emptied filter press cake into a roll-off bin. Operators started up the well-field at 0740. FBR water level was low, operators to investigate.
- Thursday, 21 April 2022: Operators performed general O&M. Operator started the auto-sampler for collection of the weekly NPDES compliance samples. Rain-For-Rent picked up the bag filter skid offsite. Tank T-12 bag filters fouled out causing tanks to overflow on the bio-side early morning, operators changed out the bag filters and managed tank levels.

**Inoperable Recovery Well Status**

- RW-08: Turned off due to lack of hydraulic productivity.
- RW-09: Off due to fouled pump.
- RW-13i: Off due to fouled pump.

- RW-16i: Off due to fouled pump.
- RW-24i: Off due to issues with flow meter not communicating with PLC. Additional troubleshooting is required.

**Sampling**

- Carbon HPC analysis samples collected 18 April 2022.
- LGAC check samples collected on 19 April 2022.
- Monthly NPDES compliance samples collected on 22 April 2022.

**Stormwater**

- No stormwater samples collected this week.
- Weekly ISCO sampler inspection conducted.



**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 22 April 2022 to 28 April 2022**  
**Former Arkema Facility, Portland, Oregon**

### **Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge proceeded continuously with the exception of a 1 hour 20 minute scheduled shutdown to clean the plate separator. Uptime for the reporting period was 99 percent. The average system influent flow rate was 12.3 gpm. Recovery wells RW-05 through RW-07, RW-10 through RW-12, RW-14, RW-15, RW-18 through RW-23, RW-25, and RW-26 were in operation during the reporting period.

Notable activities that occurred within the reporting period include the following:

- Friday, 22 April 2022: Operators performed general O&M. Operator collected weekly NPDES compliance samples. Installed a new level sensor at tank T-12 and recalibrated. Operators worked with S. Lucas to add tank T-12 to outgoing alarms.
- Saturday, 23 April 2022: Operators performed general O&M.
- Sunday, 24 April 2022: Operators performed general O&M.
- Monday, 25 April 2022: Operators performed general O&M, cycled the filter press, and housekeeping. Installed sample tap on SF-EFF for tank T-5 turbidimeter. Delivery off-loaded 1-tote of liquid Urea.
- Tuesday, 26 April 2022: Operators performed general O&M and housekeeping. Operators shut down the well-field at 0800 to clean the plate separator and started up the well-field at 0920. Adjusted the plate separator underflow pump timer P-PS-1 to 150 seconds / 800 seconds from 250 seconds / 800 seconds. Calibrated PR-1 pH probe.
- Wednesday, 27 April 2022: Operators performed general O&M, cycled the filter press, and housekeeping. Operator started the auto-sampler for collection of the weekly NPDES compliance samples.
- Thursday, 28 April 2022: Operators performed general O&M and emptied filter press cake into a roll-off bin. Operator collected weekly NPDES compliance samples. Installed new Mercoid transducer at PA-23d with a 1-1/4 to 1/2 inch reducer bushing cap.

### **Inoperable Recovery Well Status**

- RW-08: Turned off due to lack of hydraulic productivity.
- RW-09: Off due to fouled pump.
- RW-13i: Off due to fouled pump.
- RW-16i: Off due to fouled pump.
- RW-24i: Off due to issues with flow meter not communicating with PLC. Additional troubleshooting is required.

### **Sampling**

- Weekly NPDES compliance samples collected on 28 April 2022.

### **Stormwater**

- No stormwater samples collected this week.
- Weekly ISCO sampler inspection conducted.



**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 29 April 2022 to 5 May 2022**  
**Former Arkema Facility, Portland, Oregon**

**Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge proceeded continuously with the exception of a brief 1-hour power outage on 30 April. Uptime for the reporting period was 99 percent. The average system influent flow rate was 11.4 gpm. Recovery wells RW-05 through RW-07, RW-10 through RW-12, RW-14, RW-15, RW-18 through RW-23, RW-25, and RW-26 were in operation during the reporting period.

Notable activities that occurred within the reporting period include the following:

- Friday, 29 April 2022: Operators performed general O&M. Operators reconfigured hoses at tank T-5 bag filters from 2 inches to 3 inches. Adjusted flow rate at pump P-10 from 30 gpm to 40 gpm.
- Saturday, 30 April 2022: Operators performed general O&M. Brief power outage at 0600, operator restarted the well field at 0720.
- Sunday, 1 May 2022: Operators performed general O&M.
- Monday, 2 May 2022: Operators performed general O&M. Re-plumbed tank T-12 to bypass the bag filters. Mobilized to a recycle facility to dispose of scrap metal from the site. Adjusted PID (proportional-integral-derivative) controls for pump P-10 on PLC, proportional changed from 3 to 2.
- Tuesday, 3 May 2022: Operators performed general O&M. Performed monthly inspections on fire extinguishers, shower/eye wash, and AED. Backwashed carbon vessel CT-2. Operators mixed 40 gal of Imazapyr herbicide and sprayed the west side of GWET plant stormwater trench. Installed the PID at the plate separator.
- Wednesday, 4 May 2022: Operators performed general O&M and cycled the filter press. Operator started the auto-sampler for collection of the weekly NPDES compliance samples. Operator re-primed the pre-treatment side caustic pump, PR-1 at pH=6.47. Operators redeveloped recovery well RW-23 and observed 3/10 feet of silt. Changed out pumps at RW-23 and RW-14.
- Thursday, 5 May 2022: Operators performed general O&M. Operator collected weekly NPDES compliance samples. Operators attended forklift training and a safety stand-down meeting to learn about Total's new Golden Rules.

**Inoperable Recovery Well Status**

- RW-08: Turned off due to lack of hydraulic productivity.
- RW-09: Off due to fouled pump.
- RW-13i: Off due to fouled pump.
- RW-16i: Off due to fouled pump.

- RW-24i: Off due to issues with flow meter not communicating with PLC. Additional troubleshooting is required.

**Sampling**

- Weekly NPDES compliance samples collected on 5 May 2022.

**Stormwater**

- No stormwater samples collected this week.
- Weekly ISCO sampler inspection conducted.



**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 6 May 2022 to 12 May 2022**  
**Former Arkema Facility, Portland, Oregon**

### **Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge proceeded continuously. Uptime for the reporting period was 100 percent. The average system influent flow rate was 13.7 gpm. Recovery wells RW-05 through RW-07, RW-10 through RW-12, RW-14, RW-15, RW-18 through RW-23, RW-25, and RW-26 were in operation during the reporting period.

Notable activities that occurred within the reporting period include the following:

- Friday, 6 May 2022: Operators performed general O&M. Swapped the 2-inch diaphragm pump P-PS-4 at T-8 with the 1-inch diaphragm pump P-PS-9 at T-12. Reduced urea pump CFP-13 stroke rate from 2 percent to 1.8 percent. Installed a sample port at tanks T-4 and T-12. Installed 2-inch schedule 80 pipe from LGAC to tank T-3.
- Saturday, 7 May 2022: Operators performed general O&M. Reduced urea pump CFP-13 stroke length from 100 percent to 75 percent, NH3 residual at 6 mg/L.
- Sunday, 8 May 2022: Operators performed general O&M and cycled the filter press. Reduced urea pump CFP-13 stroke rate from 1.8 percent to 1.6 percent.
- Monday, 9 May 2022: Operators performed general O&M and cycled the filter press. Cochran onsite for Arc Flash audit. Dumped filter cake bins into roll-off box. Applied herbicide to stormwater trench. Evaluate RW-14 and RW-17 operational status.
- Tuesday, 10 May 2022: Operators performed general O&M. Applied herbicide at the front gate. Cochran onsite to complete the Arc Flash audit and will return 19 May to label the equipment. Operators performed jar testing on pre-treatment side and test for total solids.
- Wednesday, 11 May 2022: Operators performed general O&M and cycled the filter press. Operator started the auto-sampler for collection of the weekly NPDES compliance samples. Conducted monthly water levels and recalibrated the following wells: MWA-34i, MWA-58d, PA-03, PA-08, PA-09, PA-19d, PA-21d, PA-22d, PA-23d, PA-24d, PA-25d, PA-26d, PA-27d, RW-8, and RW-24i.
- Thursday, 12 May 2022: Operators performed general O&M. Operator collected weekly NPDES compliance samples.

### **Inoperable Recovery Well Status**

- RW-08: Turned off due to lack of hydraulic productivity.
- RW-09: Off due to fouled pump.
- RW-13i: Off due to fouled pump.
- RW-16i: Off due to fouled pump.
- RW-24i: Off due to issues with flow meter not communicating with PLC. Additional troubleshooting is required.



**Sampling**

- Weekly NPDES compliance samples collected on 12 May 2022.

**Stormwater**

- No stormwater samples collected this week.
- Weekly ISCO sampler inspection conducted.



**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 13 May 2022 to 19 May 2022**  
**Former Arkema Facility, Portland, Oregon**

### **Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge proceeded continuously. Uptime for the reporting period was 100 percent. The average system influent flow rate was 15.1 gpm. Recovery wells RW-5, RW-6, RW-7, RW-10, RW-11, RW-12, RW-14, RW-15, RW-17 through RW-23, RW-25, and RW-26 were in operation during the reporting period.

Notable activities that occurred within the reporting period include the following:

- Friday, 13 May 2022: Operators performed general O&M. Emptied filter press bins into roll-off box. Changed out I/O card at RW-22, transducer PA-09 is now operating.
- Saturday, 14 May 2022: Operators performed general O&M. Replaced polymer makedown pump tubing and batched EA-230.
- Sunday, 15 May 2022: Operators performed general O&M.
- Monday, 16 May 2022: Operators performed general O&M and cycled the filter press. Emptied filter press bins into roll-off box. Applied Garlon herbicide along south fence line. Repaired leaking underflow pump P-PS-1.
- Tuesday, 17 May 2022: Operators performed general O&M. Applied Garlon herbicide to the well-field and along Front Avenue. Emptied filter press bins into roll-off box. Changed out transducer at PA-08 from KPSI to Mercoid and recalibrated, new LTE=9.89 feet. Operator updated transducer pressure range on the PLC. Recalibrated transducer PA-09, new LTE=8.00 feet.
- Wednesday, 18 May 2022: Operators performed general O&M and cycled the filter press. Operator started the auto-sampler for collection of the quarterly NPDES compliance samples. Subcontractors PBS and CAPE onsite to survey control points and trench locations.
- Thursday, 19 May 2022: Operators performed general O&M. Operator collected quarterly NPDES compliance samples. Observed a leak at the cam-lock connection from transfer pump P-PS-9 to the sand filter, operators cleaned and reseated the cam-lock. Cochran onsite and completed the Arc Flash analysis in the MCC rooms, labels to be installed next week. Univar onsite to batch caustic.

### **Inoperable Recovery Well Status**

- RW-08: Turned off due to lack of hydraulic productivity.
- RW-05, RW-09, RW-13i, RW-16i, RW-26i: Off due to fouled pump.
- RW-24i: Off due to issues with flow meter not communicating with PLC. Additional troubleshooting is required.

### **Sampling**

- Quarterly NPDES compliance samples collected on 19 May 2022.

### **Stormwater**

- No stormwater samples collected this week.
- Weekly ISCO sampler inspection conducted.



**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 20 May 2022 to 26 May 2022**  
**Former Arkema Facility, Portland, Oregon**

### **Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge proceeded continuously until a scheduled shutdown on 20 May. The well field was shut down at 1300, and discharge to the river stopped at 1400 for the upcoming trench construction. Uptime for the reporting period was 8 percent. The average system influent flow rate was 0 gpm. Recovery wells RW-06, RW-07, RW-10, RW-11, RW-12, RW-14, RW-15, RW-17 through RW-23, and RW-25 were in operation during the reporting period until the shutdown.

Notable activities that occurred within the reporting period include the following:

- Friday, 20 May 2022: Operators performed general O&M and emptied the filter press bins into a roll-off box. Backwashed carbon vessel CT-2 to tank T-10. GPRS onsite for locates at the well-field trenches. Operators shut down the well field at 1300, and discharge to the river stopped at 1400. Placed the FBR in a recirculation loop with the sand filter effluent.
- Monday, 23 May 2022: Cascade and Odin drilling team onsite. Waste Management relocated site 30-yard bin away from Trench 1. Operators removed the de-humidifier near the Precipitate Reactor (PR-1) and installed influent isolation valves for the shallow (3 inches) and intermediate (2 inches) conveyance pipe. Operators observed DNAPL in shallow influent conveyance pipe. Mobilized to the well field to apply Garlon herbicide.
- Tuesday, 24 May 2022: Cascade and Odin drilling team onsite at Trench 4. Operator transferred tank T-6 water into totes as reserve. Installed 2-inch saddle tap at the LGAC influent pipe to recirculate water from T-5 bag filters to tank T-3. Installed ball check and ball valve from tank T-8 (P-PS-4) to PR-1. Operator performed a test on DNAPL and heated sample in water to 120 degrees Fahrenheit, DNAPL went to a liquid phase then added concentrated Simple Green and the DNAPL dropped out of water.
- Wednesday, 25 May 2022: Cascade and Odin drilling team onsite. Operator started cleaning tank T-6. Removed old chemical feed pumps for M.1883 coagulant and EA-230 polymer and prepared the upgraded chemical feed pumps. Opened the seized butterfly valve at pump P-7. Electrical subcontractor, Cochran, was called onsite to troubleshoot P-7 motor starter and replaced a bad fuse. Measured FBR carbon bed height at 14 feet at 607 gpm while P-8 operated at 15.5 feet at 687 gpm while P-7 operated. NorthStar chemical dropped off polymer sample for bench testing at tank T-9. Backup filter press AODD pump was delivered.
- Thursday, 26 May 2022: Cascade and Odin drilling team onsite. Operators relocated tank T-3 turbidimeter. Completed cleaning tank T-6 and began cleaning tank T-5. Began installation/relocation of de-humidifier at PR-1.

### **Sampling**

- No samples collected this week due to planned shutdown.

## **Stormwater**

- No stormwater samples collected this week.



**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 27 May 2022 to 2 June 2022**  
**Former Arkema Facility, Portland, Oregon**

### **Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge remained off during the reporting period. Uptime for the reporting period was 0 percent. The average system influent flow rate was 0.0 gpm. Recovery wells were off during the reporting period.

Notable activities that occurred within the reporting period include the following:

- Friday, 27 May 2022: Cascade and Odin drilling team onsite. Operators completed cleaning of tank T-5. Installed the de-humidifier at PR-1. Installed new chemical feed pumps for M.1883 coagulant and EA-230 polymer including cables for alarms, start/stop, and speed.
- Saturday, 28 May 2022: Operators continued installation of the de-humidifier at PR-1 including connecting fittings and hoses. Re-configured auxiliary recirculation pipe and valve at GWET-INF and observed hand size pieces of DNAPL.
- Tuesday, 31 May 2022: Cascade and Odin drilling team onsite. Opened FBR recycle line from LGAC-INF to tank T-3 to clean out tank T-5. Drillers observed white fibrous material during sampling and will not drill beyond 20 feet to control the hazard.
- Wednesday, 1 June 2022: Cascade and Odin drilling team onsite. Mobilized to the well field to apply Garlon herbicide. Univar onsite to swap out malfunctioning telemetry on the caustic mini-bulk. Operators tested the RC boat for future sampling.
- Thursday, 2 June 2022: Cascade and Odin drilling team onsite. Operators cleaning tank T-3.

### **Sampling**

- No samples collected this week due to plant shutdown.

### **Stormwater**

- No stormwater samples collected this week.
- Weekly ISCO sampler inspection conducted.



**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 3 June 2022 to 9 June 2022**  
**Former Arkema Facility, Portland, Oregon**

### **Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge remained off during the reporting period. Uptime for the reporting period was 0 percent. The average system influent flow rate was 0.0 gpm. Recovery wells were off during the reporting period.

Notable activities that occurred within the reporting period include the following:

- Friday, 3 June 2022: Completed June water level event. Operators completed cleaning of tank T-1. Set up ISCO sampler for an upcoming storm.
- Monday, 6 June 2022: Q2 groundwater sampling event. Operators transferred T-6 water from totes into the system. Installed cable from LCP-3 to pre-treatment side PID located at PS-1. Inspected ladders and eyewash stations.
- Tuesday, 7 June 2022: Q2 groundwater sampling event. Operators performed general housekeeping. NW Area Manager Jason Goetz onsite for site walk. Telluric onsite for vegetation removal / brush clearing.
- Wednesday, 8 June 2022: Q2 groundwater sampling event. Operator worked with S. Lucas to troubleshoot the FBR recirc control valve. Installed the de-humidifier hoses at VGAC. Re-configured GWET influent piping.
- Thursday, 9 June 2022: Q2 groundwater sampling event. Telluric onsite for vegetation removal / brush clearing. Operator worked with S. Lucas to troubleshoot the FBR recirc control valve. Disassembled the GWET influent piping and developed a plan to clean the piping with a pressure washer.

### **Sampling**

- No samples collected this week due to plant shutdown.

### **Stormwater**

- Stormwater samples collected 7 June 2022.
- Weekly ISCO sampler inspection conducted.



**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 10 June 2022 to 16 June 2022**  
**Former Arkema Facility, Portland, Oregon**

### **Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge remained off during the reporting period. Uptime for the reporting period was 0 percent. The average system influent flow rate was 0.0 gpm. Recovery wells were off during the reporting period.

- Friday, 10 June 2022: Operator worked with S. Lucas to add tank T-5 bag filter differential pressure to the PLC. Mobilized to well-field to check calibrations at transducer PA-08 and PA-16. Odin subcontractor Alpha Environmental onsite to collect suspect asbestos samples from Trench 3+4.
- Monday, 13 June 2022: Telluric onsite for vegetation removal. Reconfigured wiring for caustic pump CFP-1 and HCl pump CFP-2. Replaced malfunctioning sump (SP-1) float switch on pre-treatment side. Completed wiring the fixed VOC meter (PID). Repaired and re-installed 2-inch pump at P-PS-9, replaced the diaphragm. Cleaned the GWET influent piping with a pressure washer and hot water with Simple Green and re-assembled the piping.
- Tuesday, 14 June 2022: Telluric onsite for vegetation removal. Operator installed 4x4 outlet for polymer make-down skid. Operator worked with S. Lucas to troubleshoot the Urea pump CFP-13. Mobilized to the well-field lot 2 to apply Garlon herbicide. HPS onsite to inspect seized transfer pump P-9 at tank T-5, re-installed pump. Changed T5 bag filters with 0.5 um.
- Wednesday, 15 June 2022: Operators mobilized to the well field to apply Garlon herbicide. Mobilized to recovery well RW-22 to change out the pump and corroded motor, re-developed the well with a surge block, and upgraded the downhole piping to a 25-foot-long hose plus approximately 3-foot pipe. Operators can now re-deploy the pump/motor assemble with hose by hand without a forklift. Installed tubing at pumps CFP-1 (caustic), CFP-9 (M.1883 coagulant), and CFP-3B (EA-230 polymer). Added HCl to tank T-3 to lower the pH from 9.45 to 7.65.
- Thursday, 16 June 2022: Telluric onsite for vegetation removal. Mobilized to recovery well RW-23 to change out the pump. Inspected and repaired leak at 2-inch pump at P-PS-9.

### **Sampling**

- No samples collected this week due to plant shutdown.

### **Stormwater**

- No stormwater samples collected this week.





**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 17 June 2022 to 23 June 2022**  
**Former Arkema Facility, Portland, Oregon**

### **Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge remained off during the reporting period with the exception of a brief period on 21 June described below. Uptime for the reporting period was 2 percent. The average system influent flow rate was 0.0 gpm. Recovery wells were off during the reporting period except for a 3-hour period on 21 June to fill tank T-1 using RW-14, RW-23, and RW-25.

- Friday, 17 June 2022: Telluric onsite to complete vegetation removal. Operator cleaned and assembled 1-hp pump. Worked with S. Lucas to re-program CFP-13 urea pump and confirmed CFP-9 and CFP-3B pumps are functioning. Transferred debris/creosote into a roll-off box for landfilling. Mobilized to recovery well RW-22 to pull pump and measured top of casing at 29.8 feet and total depth at 32.3 feet.
- Monday, 20 June 2022: Operator worked with S. Lucas to troubleshoot caustic pump CFP-1. Conducted post vegetation removal site-walk and identified contact with a concrete vault. Reconfigured bio-side chemical feed pumps drums and wiring. FBR ORP = 129 mV, NH3 = 0.00 mg/L, PO4 = 1.91 mg/L, COD = 121 mg/L. Added 4 cups of granular urea.
- Tuesday, 21 June 2022: Operators worked on troubleshooting CFP-1 caustic pump. Mobilized to Scappoose Waste Water Treatment Plant to obtain activated sludge to re-seed the FBR. Added 150 gal of activated sludge to the FBR. Calibrated pH probes at the precipitate reactor and FBR-REC. Mobilized to RW-22 to troubleshoot the ground fault alarm. Started and purged recovery wells RW-23, RW-14, and RW-25; filled 2 x 250 gal totes; and filled tank T-1. Adjusted polymer EA-230 and coagulant M.1883 dosage to reflect the smaller pump. FBR ORP = 45 mV, NH3 = 1 mg/L, PO4 = 1.51 mg/L, COD = 92 mg/L, NO3 = 1.6 mg/L, NO2 = 0.016 mg/L.
- Wednesday, 22 June 2022: TideWater transported one pretreatment sludge box and one debris/creosote roll-off box to the Roosevelt Landfill Disposal facility. Mobilized to recovery well RW-22 to inspect the ground fault alarm. Modified recirculation pipe from tank T-5 to T-3 to accommodate the transfer of process water from T-5 to outdoor frac tank. Pulled RW-12 pump/motor to use the motor in RW-22. FBR ORP = -29.96 mV, NH3 = 6 mg/L, PO4 = 1.11 mg/L, COD = 92 mg/L, NO3 = 0.1 mg/L, NO2 = 0.015 mg/L.
- Thursday, 23 June 2022: Mobilized to well field to repair piping at RW-23 and install pump/motor at RW-22. TideWater onsite to off-load two roll-off boxes. Operators worked with S. Lucas to reprogram caustic pump CFP-1. Operators repaired the stormwater sampling tubing.

### **Sampling**

- No samples collected this week due to plant shutdown.

### **Stormwater**

- No stormwater samples collected this week.



**Groundwater Extraction and Treatment (GWET) System Weekly Progress Report**  
**Week from: 24 June 2022 to 30 June 2022**  
**Former Arkema Facility, Portland, Oregon**

### **Plant Operations**

Groundwater extraction at select recovery wells, treatment, and discharge remained off during the reporting period. Uptime for the reporting period was 6 percent. The average system influent flow rate was 1.9 gpm. Recovery wells were off during the reporting period except for a 2-hour period on 27 June to fill tank T-1 and 29 June for compliance sampling using RW-14 and RW-23.

- Friday, 24 June 2022: Operators performed general O&M and managed tank levels. Operators completed piping for tank T-5 to frac tank. Changed out pump at recovery well RW-25 and re-developed well.
- Monday, 27 June 2022: Operators performed general O&M and managed tank levels. Collected check samples at FBR-EFF. Started recovery wells RW-14 and RW-23 to fill tank T-1. Cintas onsite for fire extinguisher inspection. Frac tank onsite, operators connected hoses from frac tank to T-5 piping and test for leaks.
- Tuesday, 28 June 2022: Operator used a weed trimmer around GWET plant. Transferred water from tank T-5 to the frac tank. Backwashed carbon vessels CT-1 and CT-2 with T-6 water to T-10. Re-calibrated transducers at PA-06, RW-22, PA-08, and RW-25. Inspected FBR recirculation pumps P-7 and P-8. Operators observed a leak at pump P-8 and a non-functioning butterfly valve at pump P-7 to control the FBR recirculation rate. To control the recirculation rate, operators manually throttled the flow with a butterfly valve at the FBR-INF (666 gpm to 600 gpm).
- Wednesday, 29 June 2022: Operators performed general O&M, used a weed trimmer around GWET plant, and managed tank levels. Turned on recovery wells RW-14 and RW-23 at 10 gpm to collect compliance sampling suite, seven composite samples collected at the final polishing vessel with discharged to the outside frac tank. Repaired pumps CFP-1 (caustic) and CFP-9 (coagulant). Set up hoses from recovery well RW-23 to the GWET plant and ran hose from compressor room to RW-23.
- Thursday, 30 June 2022: Operators performed general O&M. Weekly compliance samples collected. FBR recirculation pump P-8 has since been locked-out-tagged-out, removed, and scheduled to be repaired offsite.

### **Sampling**

- Check samples collected Monday 27 June 2022 at FBR-EFF.
- Check compliance samples collected 29 June 2022 at GWET-INF and final polishing vessel.

### **Stormwater**

- No stormwater samples collected this week.
- ISCO sampler tubing repaired.

**ATTACHMENT 2   QUARTER 1, 2022, GROUNDWATER MONITORING DATA**

**Table 2-1**  
**Volatile Organic Compounds Results**  
**Arkema Quarter 1, 2022, Groundwater Monitoring Report**  
**Arkema Inc. Facility**  
**Portland, Oregon**

Analyte					1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene
Unit					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
FSWP SHSC (shaded values indicate results above the value shown)					NE	11	0.4	1.6	47	710	NE	NE	NE	0.076
Location ID	Sample Date	Sample Type	Aquifer Classification	Sample ID										
MWA-41	3/14/2022	N	Shallow	MWA-41-031422	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	<b>0.078 j</b>	< 0.035 U	< 0.084 U	< 0.15 U	< 0.050 U	< 0.17 U
MWA-63	3/15/2022	N	Shallow	MWA-63-031522	< 1.8 UJ	<b>4.3 J</b>	< 5.2 UJ	< 2.4 UJ	< 2.2 UJ	< 2.8 UJ	<b>4.3 J</b>	< 4.3 UJ	< 4.1 UJ	< 3.3 UJ
MWA-82	3/14/2022	N	Shallow	MWA-82-031422	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	< 0.025 U	< 0.035 UJ	< 0.084 U	< 0.15 UJ	< 0.050 U	< 0.17 UJ
PA-03	3/16/2022	N	Shallow	PA-03-031622	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	<b>0.14 j</b>	< 0.035 U	< 0.084 U	< 0.15 UJ	< 0.050 U	< 0.17 UJ
PA-04	3/17/2022	N	Shallow	PA-04-031722	< 0.038 U	<b>0.036 j</b>	< 0.056 U	< 0.070 U	<b>0.13 j</b>	<b>0.13 j</b>	< 0.084 U	< 0.15 UJ	< 0.050 U	< 0.17 UJ
PA-08	3/14/2022	N	Shallow	PA-08-031422	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	<b>0.17 j</b>	< 0.035 U	< 0.084 U	< 0.15 U	< 0.050 U	< 0.17 U
PA-09	3/15/2022	N	Shallow	PA-09-031522	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	<b>0.096 j</b>	< 0.035 U	< 0.084 U	< 0.15 UJ	< 0.050 U	< 0.17 UJ
PA-31	3/15/2022	N	Shallow	PA-31-031522	< 0.038 U	<b>0.22</b>	< 0.056 U	< 0.070 U	<b>0.20</b>	<b>0.67</b>	< 0.084 U	< 0.15 U	< 0.050 U	< 0.17 U
PA-31	3/15/2022	FD	Shallow	DUP-01-031522	< 0.038 U	<b>0.19 j</b>	< 0.056 U	< 0.070 U	<b>0.21</b>	<b>0.73</b>	< 0.084 U	< 0.15 U	< 0.050 U	< 0.17 U
MWA-81i	3/14/2022	N	Intermediate	MWA-81i-031422	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	<b>0.072 j</b>	< 0.035 U	< 0.084 U	< 0.15 U	< 0.050 U	<b>0.27 j</b>
PA-10i	3/17/2022	N	Intermediate	PA-10i-031722	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	< 0.025 U	<b>0.13 j</b>	< 0.084 U	< 0.15 U	< 0.050 U	< 0.17 U
PA-15i	3/14/2022	N	Intermediate	PA-15i-031422	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	<b>0.33</b>	< 0.035 U	< 0.084 U	< 0.15 U	< 0.050 U	< 0.17 U
PA-16i	3/15/2022	N	Intermediate	PA-16i-031522	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	<b>0.21</b>	< 0.035 U	< 0.084 U	< 0.15 U	< 0.050 U	< 0.17 U
PA-17iR	3/16/2022	N	Intermediate	PA-17iR-031622	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	<b>0.11 j</b>	<b>0.28</b>	< 0.084 U	< 0.15 UJ	< 0.050 U	< 0.17 UJ
PA-32i	3/15/2022	N	Intermediate	PA-32i-031522	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	<b>0.032 j</b>	<b>0.095 j</b>	< 0.084 U	< 0.15 U	< 0.050 U	< 0.17 U
PA-44i	3/15/2022	N	Intermediate	PA-44i-031522	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	<b>0.10 j</b>	< 0.035 U	< 0.084 U	< 0.15 U	< 0.050 U	< 0.17 U
MWA-11i(d)	3/17/2022	N	Deep	MWA-11i(D)-031722	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	<b>0.037 j</b>	< 0.035 U	< 0.084 U	< 0.15 U	< 0.050 U	< 0.17 U
MWA-31i(d)	3/16/2022	N	Deep	MWA-31i(D)-031622	< 0.18 UJ	< 0.39 U	< 0.52 U	< 0.24 U	<b>0.56 J</b>	<b>0.35 J</b>	< 0.29 U	< 0.43 UJ	< 0.41 U	< 0.33 UJ
MWA-56d	3/17/2022	N	Deep	MWA-56D-031722	< 0.18 U	< 0.39 U	< 0.52 U	< 0.24 U	< 0.22 U	< 0.28 U	< 0.29 U	< 0.43 U	< 0.41 U	< 0.33 U
MWA-58d	3/17/2022	N	Deep	MWA-58D-031722	< 1.8 U	< 3.9 U	< 5.2 U	< 2.4 U	< 2.2 U	< 2.8 U	< 2.9 U	< 4.3 U	< 4.1 U	< 3.3 U
MWA-58d	3/17/2022	FD	Deep	DUP-02-031722	< 0.18 U	< 0.39 U	< 0.52 U	< 0.24 U	< 0.22 U	< 0.28 U	< 0.29 U	< 0.43 U	< 0.41 U	< 0.33 UJ
PA-19d	3/17/2022	N	Deep	PA-19D-031722	< 9.0 U	< 20 U	< 26 U	< 12 U	< 11 U	< 14 U	< 15 U	< 22 U	< 21 U	< 17 U
PA-20d	3/17/2022	N	Deep	PA-20D-031722	< 0.18 U	< 0.39 U	< 0.52 U	< 0.24 U	<b>0.55 J</b>	< 0.28 U	< 0.29 U	< 0.43 U	< 0.41 U	< 0.33 U
PA-21d	3/17/2022	N	Deep	PA-21D-031722	< 90 U	< 200 U	< 260 U	< 120 U	< 110 U	< 140 U	< 150 U	< 220 U	< 210 U	< 170 U
PA-22d	3/16/2022	N	Deep	PA-22D-031622	< 0.18 UJ	< 0.39 U	< 0.52 U	< 0.24 U	<b>0.46 J</b>	<b>0.35 J</b>	< 0.29 U	< 0.43 UJ	< 0.41 U	< 0.33 UJ
PA-23d	3/16/2022	N	Deep	PA-23D-031622	< 0.18 UJ	< 0.39 U	< 0.52 U	< 0.24 U	< 0.22 U	< 0.28 UJ	< 0.29 U	< 0.43 U	< 0.41 U	< 0.33 UJ
PA-24d	3/16/2022	N	Deep	PA-24D-031622	< 0.18 UJ	< 0.39 U	< 0.52 U	< 0.24 U	< 0.22 U	< 0.28 UJ	< 0.29 U	< 0.43 U	< 0.41 U	< 0.33 UJ
PA-25d	3/14/2022	N	Deep	PA-25D-031422	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	< 0.025 U	< 0.035 U	< 0.084 U	< 0.15 U	< 0.050 U	< 0.17 U
PA-26d	3/15/2022	N	Deep	PA-26D-031522	< 0.038 U	< 0.025 U	< 0.056 U	< 0.070 U	< 0.025 U	< 0.035 U	< 0.084 U	< 0.15 U	< 0.050 U	< 0.17 U
PA-27d	3/16/2022	N	Deep	PA-27D-031622	< 0.18 UJ	< 0.39 U	< 0.52 U	< 0.24 U	< 0.22 U	< 0.28 U	< 0.29 U	< 0.43 UJ	< 0.41 U	< 0.33 UJ
PA-30d	3/17/2022	N	Deep	PA-30D-031722	< 9.0 U	< 20 U	< 26 U	< 12 U	< 11 U	< 14 U	< 15 U	< 22 U	< 21 U	< 17 U

Notes:  
 Bolded values indicate concentrations above the Method Detection Limit.  
 Shaded values indicate concentrations above the FSWP SHSC.  
 < = Compound not detected. Method Detection Limit shown.  
 µg/L = micrograms per liter  
 FD = Field Duplicate Sample  
 FSWP SHSC = Feasibility Study Work Plan Indirect Exposure Pathway Selected Hot Spot Criteria  
 N = Normal Environmental Sample  
 NE = Not Established  
 SW8260C analyses performed by TestAmerica - Seattle, WA of Seattle.

Qualifiers - Organic:  
 j = The analyte was positively identified below the RDL; associated numerical value is the approximate concentration of the analyte in the sample.  
 J = The concentration of the sample is considered to be an estimate with no bias, as the associated QC results were outside the control limits.  
 J+ = The concentration of the sample is considered to be biased high, as the associated QC results exceed the upper control limits.  
 U = Analyte was analyzed for, but not detected above, the limit displayed.  
 UJ = Analyte was analyzed for, but not detected. The detection limit is a quantitative estimate.

**Table 2-1**  
**Volatile Organic Compounds Results**  
**Arkema Quarter 1, 2022, Groundwater Monitoring Report**  
**Arkema Inc. Facility**  
**Portland, Oregon**

Analyte					1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	1,2-Dichloropropane
Unit					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
FSWP SHSC (shaded values indicate results above the value shown)					NE	NE	14	3.7	1.5	NE	10	NE	15	NE
Location ID	Sample Date	Sample Type	Aquifer Classification	Sample ID										
MWA-41	3/14/2022	N	Shallow	MWA-41-031422	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
MWA-63	3/15/2022	N	Shallow	MWA-63-031522	< 6.1 UJ	< 5.7 UJ	< 4.6 UJ	< 4.2 UJ	4.1 J	< 5.5 UJ	< 4.8 UJ	< 3.5 UJ	< 4.6 UJ	< 3.2 UJ
MWA-82	3/14/2022	N	Shallow	MWA-82-031422	< 0.20 U	< 0.17 UJ	0.078 j	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-03	3/16/2022	N	Shallow	PA-03-031622	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-04	3/17/2022	N	Shallow	PA-04-031722	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-08	3/14/2022	N	Shallow	PA-08-031422	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-09	3/15/2022	N	Shallow	PA-09-031522	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-31	3/15/2022	N	Shallow	PA-31-031522	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-31	3/15/2022	FD	Shallow	DUP-01-031522	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
MWA-81i	3/14/2022	N	Intermediate	MWA-81i-031422	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-10i	3/17/2022	N	Intermediate	PA-10i-031722	< 0.20 U	< 0.17 U	0.20 j	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-15i	3/14/2022	N	Intermediate	PA-15i-031422	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-16i	3/15/2022	N	Intermediate	PA-16i-031522	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-17iR	3/16/2022	N	Intermediate	PA-17iR-031622	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-32i	3/15/2022	N	Intermediate	PA-32i-031522	< 0.20 U	< 0.17 U	0.18 j	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-44i	3/15/2022	N	Intermediate	PA-44i-031522	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
MWA-11i(d)	3/17/2022	N	Deep	MWA-11i(D)-031722	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
MWA-31i(d)	3/16/2022	N	Deep	MWA-31i(D)-031622	< 0.61 U	< 0.57 U	< 0.46 U	< 0.42 U	0.41 J	< 0.55 U	< 0.48 U	< 0.35 U	< 0.46 U	< 0.32 U
MWA-56d	3/17/2022	N	Deep	MWA-56D-031722	< 0.61 U	< 0.57 U	< 0.46 U	< 0.42 U	< 1.8 UJ	< 0.55 U	< 0.48 U	< 0.35 U	< 0.46 U	< 0.32 U
MWA-58d	3/17/2022	N	Deep	MWA-58D-031722	< 6.1 U	< 5.7 U	< 4.6 U	< 4.2 U	4.2 J	< 5.5 U	< 4.8 U	< 3.5 U	< 4.6 U	< 3.2 U
MWA-58d	3/17/2022	FD	Deep	DUP-02-031722	< 0.61 U	< 0.57 U	< 0.46 U	< 0.42 U	20 J	< 0.55 U	< 0.48 U	< 0.35 U	< 0.46 U	< 0.32 U
PA-19d	3/17/2022	N	Deep	PA-19D-031722	< 31 U	< 29 U	< 23 U	< 21 U	< 9.0 UJ	< 28 U	< 24 U	< 18 U	< 23 U	< 16 U
PA-20d	3/17/2022	N	Deep	PA-20D-031722	< 0.61 U	< 0.57 U	< 0.46 U	< 0.42 U	< 0.18 UJ	< 0.55 U	< 0.48 U	< 0.35 U	< 0.46 U	< 0.32 U
PA-21d	3/17/2022	N	Deep	PA-21D-031722	< 310 U	< 290 U	< 230 U	< 210 U	< 90 UJ	< 280 U	< 240 U	< 180 U	< 230 UJ	< 160 U
PA-22d	3/16/2022	N	Deep	PA-22D-031622	< 0.61 U	< 0.57 U	< 0.46 U	< 0.42 U	0.42 J	< 0.55 U	< 0.48 U	< 0.35 U	< 0.46 U	< 0.32 U
PA-23d	3/16/2022	N	Deep	PA-23D-031622	< 0.61 U	< 0.57 U	< 0.46 U	< 0.42 U	< 0.18 U	< 0.55 U	< 0.48 U	< 0.35 U	< 0.46 U	< 0.32 U
PA-24d	3/16/2022	N	Deep	PA-24D-031622	< 0.61 U	< 0.57 U	< 0.46 U	0.54 j	< 0.18 U	< 0.55 U	< 0.48 U	< 0.35 U	< 0.46 U	< 0.32 U
PA-25d	3/14/2022	N	Deep	PA-25D-031422	< 0.20 U	< 0.17 U	< 0.038 U	< 0.043 U	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-26d	3/15/2022	N	Deep	PA-26D-031522	< 0.20 U	< 0.17 U	< 0.038 U	0.21	< 0.060 U	< 0.15 U	< 0.050 U	< 0.025 U	< 0.050 U	< 0.060 U
PA-27d	3/16/2022	N	Deep	PA-27D-031622	< 0.61 U	< 0.57 U	< 0.46 U	< 0.42 U	< 0.18 UJ	< 0.55 U	< 0.48 U	< 0.35 U	< 0.46 U	< 0.32 U
PA-30d	3/17/2022	N	Deep	PA-30D-031722	< 31 U	< 29 U	< 23 U	< 21 U	< 9.0 UJ	< 28 U	< 24 U	< 18 U	< 23 U	< 16 U

Notes:  
 Bolded values indicate concentrations above the Method Detection Limit.  
 Shaded values indicate concentrations above the FSWP SHSC.  
 < = Compound not detected. Method Detection Limit shown.  
 µg/L = micrograms per liter  
 FD = Field Duplicate Sample  
 FSWP SHSC = Feasibility Study Work Plan Indirect Exposure Pathway Selected Hot Spot Criteria  
 N = Normal Environmental Sample  
 NE = Not Established  
 SWB260C analyses performed by TestAmerica - Seattle, WA of Seattle.

Qualifiers - Organic:  
 j = The analyte was positively identified below the RDL; associated numerical value is the approximate concentration of the analyte in the sample.  
 J = The concentration of the sample is considered to be an estimate with no bias, as the associated QC results were outside the control limits.  
 J+ = The concentration of the sample is considered to be biased high, as the associated QC results exceed the upper control limits.  
 U = Analyte was analyzed for, but not detected above, the limit displayed.  
 UJ = Analyte was analyzed for, but not detected. The detection limit is a quantitative estimate.

**Table 2-1**  
**Volatile Organic Compounds Results**  
**Arkema Quarter 1, 2022, Groundwater Monitoring Report**  
**Arkema Inc. Facility**  
**Portland, Oregon**

Analyte					2-Butanone	4-Chlorotoluene	4-Isopropyltoluene	4-Methyl-2-pentanone	Acetone	Benzene	Bromobenzene	Bromodichloromethane	Bromoform	Bromomethane
Unit					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
FSWP SHSC (shaded values indicate results above the value shown)					14,000	NE	NE	NE	1,500	1.4	NE	1.7	14	150
Location ID	Sample Date	Sample Type	Aquifer Classification	Sample ID										
MWA-41	3/14/2022	N	Shallow	MWA-41-031422	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 U	< 3.1 U	< 0.030 U	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
MWA-63	3/15/2022	N	Shallow	MWA-63-031522	< 47 UJ	< 3.8 UJ	< 2.8 UJ	< 25 UJ	< 32 UJ	<b>2.9 J</b>	< 4.3 UJ	<b>3.9 J</b>	< 5.1 UJ	< 2.1 UJ
MWA-82	3/14/2022	N	Shallow	MWA-82-031422	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 UJ	< 3.1 U	< 0.030 U	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-03	3/16/2022	N	Shallow	PA-03-031622	< 2.5 UJ	< 0.12 U	<b>0.30 j</b>	< 1.7 UJ	< 3.1 UJ	< 0.030 U	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-04	3/17/2022	N	Shallow	PA-04-031722	< 2.5 UJ	< 0.12 U	< 0.15 U	< 1.7 UJ	< 3.1 UJ	< 0.030 U	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-08	3/14/2022	N	Shallow	PA-08-031422	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 U	< 3.1 U	<b>0.032 j</b>	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-09	3/15/2022	N	Shallow	PA-09-031522	< 2.5 UJ	< 0.12 U	< 0.15 U	< 1.7 UJ	< 3.1 UJ	< 0.030 U	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-31	3/15/2022	N	Shallow	PA-31-031522	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 U	< 3.1 U	< 0.030 U	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-31	3/15/2022	FD	Shallow	DUP-01-031522	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 U	< 3.1 U	< 0.030 U	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
MWA-81i	3/14/2022	N	Intermediate	MWA-81i-031422	< 2.5 U	< 0.12 U	<b>0.30 j</b>	< 1.7 U	< 3.1 U	< 0.030 U	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-10i	3/17/2022	N	Intermediate	PA-10i-031722	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 U	< 3.1 U	<b>0.055 j</b>	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-15i	3/14/2022	N	Intermediate	PA-15i-031422	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 U	< 3.1 U	<b>0.034 j</b>	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-16i	3/15/2022	N	Intermediate	PA-16i-031522	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 U	< 3.1 U	<b>0.035 j</b>	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-17iR	3/16/2022	N	Intermediate	PA-17iR-031622	< 2.5 UJ	< 0.12 U	<b>0.30 j</b>	< 1.7 UJ	< 3.1 UJ	< 0.030 U	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-32i	3/15/2022	N	Intermediate	PA-32i-031522	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 U	< 3.1 U	< 0.030 U	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-44i	3/15/2022	N	Intermediate	PA-44i-031522	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 U	< 3.1 U	<b>0.034 j</b>	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
MWA-11i(d)	3/17/2022	N	Deep	MWA-11i(D)-031722	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 UJ	< 3.1 U	< 0.030 U	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
MWA-31i(d)	3/16/2022	N	Deep	MWA-31i(D)-031622	< 4.7 U	< 0.38 U	< 0.28 U	< 2.5 UJ	< 3.2 U	< 0.24 U	< 0.43 U	< 0.29 U	< 0.51 U	< 0.21 U
MWA-56d	3/17/2022	N	Deep	MWA-56D-031722	< 4.7 UJ	< 0.38 U	< 0.28 U	< 25 UJ	< 3.2 U	< 0.24 U	< 0.43 U	<b>0.62 J</b>	< 0.51 U	< 0.21 U
MWA-58d	3/17/2022	N	Deep	MWA-58D-031722	< 4.7 UJ	< 3.8 U	< 2.8 U	< 25 UJ	< 32 U	< 2.4 U	< 4.3 U	< 2.9 U	< 5.1 U	< 2.1 U
MWA-58d	3/17/2022	FD	Deep	DUP-02-031722	< 4.7 UJ	< 0.38 U	< 0.28 U	< 130 UJ	< 3.2 U	< 0.24 U	< 0.43 U	<b>1.7</b>	<b>0.70 j</b>	< 0.21 U
PA-19d	3/17/2022	N	Deep	PA-19D-031722	< 240 UJ	< 19 U	< 14 U	< 130 UJ	<b>230 j</b>	< 12 U	< 22 U	< 15 U	< 26 U	< 11 U
PA-20d	3/17/2022	N	Deep	PA-20D-031722	< 4.7 UJ	< 0.38 U	< 0.28 U	< 2.5 UJ	< 3.2 U	< 0.24 U	< 0.43 U	< 0.29 U	< 0.51 U	< 0.21 U
PA-21d	3/17/2022	N	Deep	PA-21D-031722	< 2,400 UJ	< 190 U	< 140 U	< 1,300 UJ	<b>69,000</b>	< 120 U	< 220 U	< 150 U	< 260 U	< 110 U
PA-22d	3/16/2022	N	Deep	PA-22D-031622	< 4.7 U	< 0.38 U	< 0.28 U	< 2.5 UJ	< 3.2 U	< 0.24 U	< 0.43 U	<b>0.70 j</b>	< 0.51 U	< 0.21 U
PA-23d	3/16/2022	N	Deep	PA-23D-031622	< 4.7 U	< 0.38 U	< 0.28 U	< 2.5 UJ	< 3.2 U	< 0.24 U	< 0.43 U	< 0.29 U	< 0.51 U	< 0.21 U
PA-24d	3/16/2022	N	Deep	PA-24D-031622	< 4.7 U	< 0.38 U	< 0.28 U	< 2.5 UJ	< 3.2 U	< 0.24 U	< 0.43 U	< 0.29 U	< 0.51 U	< 0.21 U
PA-25d	3/14/2022	N	Deep	PA-25D-031422	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 U	< 3.1 U	<b>0.033 j</b>	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-26d	3/15/2022	N	Deep	PA-26D-031522	< 2.5 U	< 0.12 U	< 0.15 U	< 1.7 U	< 3.1 U	<b>0.036 j</b>	< 0.038 U	< 0.060 U	< 0.16 U	< 0.13 U
PA-27d	3/16/2022	N	Deep	PA-27D-031622	< 4.7 U	< 0.38 U	< 0.28 U	< 2.5 UJ	< 3.2 U	< 0.24 U	< 0.43 U	< 0.29 U	< 0.51 U	< 0.21 U
PA-30d	3/17/2022	N	Deep	PA-30D-031722	< 240 UJ	< 19 U	< 14 U	< 130 UJ	< 160 U	< 12 U	< 22 U	< 15 U	< 26 U	< 11 U

Notes:  
 Bolded values indicate concentrations above the Method Detection Limit.  
 Shaded values indicate concentrations above the FSWP SHSC.  
 < = Compound not detected. Method Detection Limit shown.  
 µg/L = micrograms per liter  
 FD = Field Duplicate Sample  
 FSWP SHSC = Feasibility Study Work Plan Indirect Exposure Pathway Selected Hot Spot Criteria  
 N = Normal Environmental Sample  
 NE = Not Established  
 SW8260C analyses performed by TestAmerica - Seattle, WA of Seattle.

Qualifiers - Organic:  
 j = The analyte was positively identified below the RDL; associated numerical value is the approximate concentration of the analyte in the sample.  
 J = The concentration of the sample is considered to be an estimate with no bias, as the associated QC results were outside the control limits.  
 J+ = The concentration of the sample is considered to be biased high, as the associated QC results exceed the upper control limits.  
 U = Analyte was analyzed for, but not detected above, the limit displayed.  
 UJ = Analyte was analyzed for, but not detected. The detection limit is a quantitative estimate.

**Table 2-1**  
**Volatile Organic Compounds Results**  
**Arkema Quarter 1, 2022, Groundwater Monitoring Report**  
**Arkema Inc. Facility**  
**Portland, Oregon**

Analyte					Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chlorobromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Dibromochloromethane
Unit					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
FSWP SHSC (shaded values indicate results above the value shown)					0.92	0.16	64	NE	NE	28	NE	590	NE	1.3
Location ID	Sample Date	Sample Type	Aquifer Classification	Sample ID										
MWA-41	3/14/2022	N	Shallow	MWA-41-031422	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 U	< 0.055 U	< 0.090 U	< 0.055 U
MWA-63	3/15/2022	N	Shallow	MWA-63-031522	< 5.3 UJ	<b>4.7 J</b>	< 4.4 UJ	<b>4.2 J</b>	< 3.5 UJ	<b>86 J</b>	< 2.8 UJ	< 3.5 UJ	<b>4.9 J</b>	< 4.3 UJ
MWA-82	3/14/2022	N	Shallow	MWA-82-031422	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	<b>0.43</b>	< 0.14 U	< 0.055 U	< 0.090 U	< 0.055 U
PA-03	3/16/2022	N	Shallow	PA-03-031622	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	<b>0.031 j</b>	< 0.14 UJ	< 0.055 U	< 0.090 U	< 0.055 U
PA-04	3/17/2022	N	Shallow	PA-04-031722	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	<b>0.082 j</b>	< 0.14 UJ	< 0.055 U	< 0.090 U	< 0.055 U
PA-08	3/14/2022	N	Shallow	PA-08-031422	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	<b>0.057 j</b>	< 0.14 U	<b>0.072 j</b>	< 0.090 U	< 0.055 U
PA-09	3/15/2022	N	Shallow	PA-09-031522	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 UJ	< 0.055 U	< 0.090 U	< 0.055 U
PA-31	3/15/2022	N	Shallow	PA-31-031522	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 U	< 0.055 U	< 0.090 U	< 0.055 U
PA-31	3/15/2022	FD	Shallow	DUP-01-031522	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 U	< 0.055 U	< 0.090 U	< 0.055 U
MWA-81i	3/14/2022	N	Intermediate	MWA-81i-031422	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 U	< 0.055 U	< 0.090 U	< 0.055 U
PA-10i	3/17/2022	N	Intermediate	PA-10i-031722	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 U	<b>0.068 j</b>	< 0.090 U	< 0.055 U
PA-15i	3/14/2022	N	Intermediate	PA-15i-031422	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 U	<b>0.067 j</b>	< 0.090 U	< 0.055 U
PA-16i	3/15/2022	N	Intermediate	PA-16i-031522	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 U	< 0.055 U	< 0.090 U	< 0.055 U
PA-17iR	3/16/2022	N	Intermediate	PA-17iR-031622	<b>0.18 j</b>	< 0.025 U	<b>0.072 j</b>	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 UJ	<b>0.068 j</b>	< 0.090 U	< 0.055 U
PA-32i	3/15/2022	N	Intermediate	PA-32i-031522	< 0.083 U	< 0.025 U	<b>0.28 J+</b>	< 0.050 U	<b>0.21 j</b>	< 0.030 U	< 0.14 U	<b>0.055 j</b>	< 0.090 U	< 0.055 U
PA-44i	3/15/2022	N	Intermediate	PA-44i-031522	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 U	< 0.055 U	< 0.090 U	< 0.055 U
MWA-11i(d)	3/17/2022	N	Deep	MWA-11i(D)-031722	< 0.083 U	< 0.025 U	<b>0.060 j</b>	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 U	< 0.055 U	< 0.090 U	< 0.055 U
MWA-31i(d)	3/16/2022	N	Deep	MWA-31i(D)-031622	<b>0.77 J</b>	< 0.30 U	< 0.44 U	< 0.29 U	< 0.35 U	<b>60 J</b>	< 0.28 U	< 0.35 U	< 0.42 U	< 0.43 U
MWA-56d	3/17/2022	N	Deep	MWA-56D-031722	< 0.53 U	< 0.30 U	< 0.44 U	< 0.29 U	< 0.35 U	<b>140 J</b>	< 0.28 U	< 0.35 U	< 0.42 U	< 0.43 U
MWA-58d	3/17/2022	N	Deep	MWA-58D-031722	< 5.3 U	< 3.0 U	< 4.4 U	< 2.9 U	< 3.5 U	<b>170 J</b>	< 2.8 U	< 3.5 U	< 4.2 U	< 4.3 U
MWA-58d	3/17/2022	FD	Deep	DUP-02-031722	< 0.53 U	< 0.30 U	< 0.44 U	< 0.29 U	< 0.35 U	<b>180 J</b>	< 0.28 U	< 0.35 U	< 0.42 U	<b>0.87 j</b>
PA-19d	3/17/2022	N	Deep	PA-19D-031722	< 27 U	< 15 U	<b>2,600</b>	< 15 U	< 18 U	< 13 UJ	< 14 U	<b>21 j</b>	< 21 U	< 22 U
PA-20d	3/17/2022	N	Deep	PA-20D-031722	< 0.53 U	< 0.30 U	<b>12</b>	< 0.29 U	< 0.35 U	< 0.26 UJ	< 0.28 U	< 0.35 U	< 0.42 U	< 0.43 U
PA-21d	3/17/2022	N	Deep	PA-21D-031722	< 270 U	< 150 U	<b>16,000</b>	< 150 U	< 180 U	<b>210 J</b>	< 140 U	< 180 U	< 210 U	< 220 U
PA-22d	3/16/2022	N	Deep	PA-22D-031622	<b>0.60 J</b>	< 0.30 U	< 0.44 U	< 0.29 U	< 0.35 U	<b>43 J</b>	<b>0.33 j</b>	< 0.35 U	< 0.42 U	<b>0.52 j</b>
PA-23d	3/16/2022	N	Deep	PA-23D-031622	< 0.53 UJ	< 0.30 U	< 0.44 U	< 0.29 U	< 0.35 U	< 0.26 U	< 0.28 U	< 0.35 U	< 0.42 U	< 0.43 U
PA-24d	3/16/2022	N	Deep	PA-24D-031622	< 0.53 UJ	< 0.30 U	< 0.44 U	< 0.29 U	< 0.35 U	< 0.26 U	< 0.28 U	< 0.35 U	< 0.42 U	< 0.43 U
PA-25d	3/14/2022	N	Deep	PA-25D-031422	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 U	< 0.055 U	< 0.090 U	< 0.055 U
PA-26d	3/15/2022	N	Deep	PA-26D-031522	< 0.083 U	< 0.025 U	< 0.060 U	< 0.050 U	< 0.096 U	< 0.030 U	< 0.14 U	< 0.055 U	< 0.090 U	< 0.055 U
PA-27d	3/16/2022	N	Deep	PA-27D-031622	< 0.53 UJ	< 0.30 U	< 0.44 U	< 0.29 U	< 0.35 U	< 0.26 UJ	< 0.28 U	<b>1.0</b>	< 0.42 U	< 0.43 U
PA-30d	3/17/2022	N	Deep	PA-30D-031722	< 27 U	< 15 U	<b>4,700</b>	< 15 U	< 18 U	< 13 UJ	< 14 U	< 18 U	< 21 U	< 22 U

Notes:  
 Bolded values indicate concentrations above the Method Detection Limit.  
 Shaded values indicate concentrations above the FSWP SHSC.  
 < = Compound not detected. Method Detection Limit shown.  
 µg/L = micrograms per liter  
 FD = Field Duplicate Sample  
 FSWP SHSC = Feasibility Study Work Plan Indirect Exposure Pathway Selected Hot Spot Criteria  
 N = Normal Environmental Sample  
 NE = Not Established  
 SW8260C analyses performed by TestAmerica - Seattle, WA of Seattle.

Qualifiers - Organic:  
 j = The analyte was positively identified below the RDL; associated numerical value is the approximate concentration of the analyte in the sample.  
 J = The concentration of the sample is considered to be an estimate with no bias, as the associated QC results were outside the control limits.  
 J+ = The concentration of the sample is considered to be biased high, as the associated QC results exceed the upper control limits.  
 U = Analyte was analyzed for, but not detected above, the limit displayed.  
 UJ = Analyte was analyzed for, but not detected. The detection limit is a quantitative estimate.

**Table 2-1**  
**Volatile Organic Compounds Results**  
**Arkema Quarter 1, 2022, Groundwater Monitoring Report**  
**Arkema Inc. Facility**  
**Portland, Oregon**

Analyte					Dibromomethane	Dichlorodifluoromethane (Freon 12)	Ethylbenzene	Ethylene dibromide	Hexachlorobutadiene	Isopropylbenzene (Cumene)	m,p-Xylenes	Methyl tert-butyl ether	Methylene chloride	Naphthalene
Unit					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
FSWP SHSC (shaded values indicate results above the value shown)					NE	NE	7.3	NE	0.01	NE	1.8	NE	59	12
Location ID	Sample Date	Sample Type	Aquifer Classification	Sample ID										
MWA-41	3/14/2022	N	Shallow	MWA-41-031422	< 0.062 U	< 0.13 UJ	< 0.030 U	< 0.025 U	< 0.067 U	< 0.19 U	< 0.12 U	< 0.070 U	< 1.2 U	< 0.22 U
MWA-63	3/15/2022	N	Shallow	MWA-63-031522	<b>3.9 J</b>	< 5.3 UJ	< 5.0 UJ	< 4.0 UJ	< 7.9 UJ	< 4.4 UJ	< 5.3 UJ	< 4.4 UJ	< 1.4 UJ	< 9.3 UJ
MWA-82	3/14/2022	N	Shallow	MWA-82-031422	< 0.062 U	< 0.13 U	< 0.030 U	< 0.025 U	< 0.067 U	< 0.19 U	< 0.12 U	< 0.070 U	< 1.2 U	< 0.22 UJ
PA-03	3/16/2022	N	Shallow	PA-03-031622	< 0.062 U	< 0.13 UJ	<b>0.042 j</b>	< 0.025 U	< 0.067 U	< 0.19 U	<b>0.28 j</b>	< 0.070 U	< 1.2 U	< 0.22 U
PA-04	3/17/2022	N	Shallow	PA-04-031722	< 0.062 U	< 0.13 UJ	<b>0.040 j</b>	< 0.025 U	< 0.067 U	<b>0.29 j</b>	<b>0.27 j</b>	< 0.070 U	< 1.2 U	< 0.22 U
PA-08	3/14/2022	N	Shallow	PA-08-031422	< 0.062 U	< 0.13 UJ	< 0.030 U	< 0.025 U	< 0.067 U	< 0.19 U	< 0.12 U	< 0.070 U	< 1.2 U	< 0.22 U
PA-09	3/15/2022	N	Shallow	PA-09-031522	< 0.062 U	< 0.13 UJ	< 0.030 U	< 0.025 U	< 0.067 U	< 0.19 U	< 0.12 U	< 0.070 U	< 1.2 U	< 0.22 U
PA-31	3/15/2022	N	Shallow	PA-31-031522	< 0.062 U	< 0.13 UJ	< 0.030 U	< 0.025 U	< 0.067 U	<b>0.29 j</b>	< 0.12 U	< 0.070 U	< 1.2 U	<b>0.22 j</b>
PA-31	3/15/2022	FD	Shallow	DUP-01-031522	< 0.062 U	< 0.13 UJ	< 0.030 U	< 0.025 U	< 0.067 U	<b>0.29 j</b>	< 0.12 U	< 0.070 U	< 1.2 U	< 0.22 U
MWA-81i	3/14/2022	N	Intermediate	MWA-81i-031422	< 0.062 U	< 0.13 UJ	< 0.030 U	< 0.025 U	< 0.067 U	< 0.19 U	< 0.12 U	< 0.070 U	< 1.2 U	<b>0.26 j</b>
PA-10i	3/17/2022	N	Intermediate	PA-10i-031722	< 0.062 U	< 0.13 U	< 0.030 U	< 0.025 U	< 0.067 U	< 0.19 U	< 0.12 U	< 0.070 U	< 1.2 U	< 0.22 U
PA-15i	3/14/2022	N	Intermediate	PA-15i-031422	< 0.062 U	< 0.13 UJ	< 0.030 U	< 0.025 U	< 0.067 U	< 0.19 U	<b>0.28 j</b>	< 0.070 U	< 1.2 U	< 0.22 U
PA-16i	3/15/2022	N	Intermediate	PA-16i-031522	< 0.062 U	< 0.13 UJ	< 0.030 U	< 0.025 U	< 0.067 U	< 0.19 U	<b>0.28 j</b>	< 0.070 U	< 1.2 U	< 0.22 U
PA-17iR	3/16/2022	N	Intermediate	PA-17iR-031622	< 0.062 U	< 0.13 UJ	<b>0.052 j</b>	< 0.025 U	< 0.067 U	< 0.19 U	<b>0.29 j</b>	< 0.070 U	< 1.2 U	< 0.22 U
PA-32i	3/15/2022	N	Intermediate	PA-32i-031522	< 0.062 U	< 0.13 UJ	< 0.030 U	< 0.025 U	< 0.067 U	<b>0.29 j</b>	< 0.12 U	< 0.070 U	< 1.2 U	<b>0.22 j</b>
PA-44i	3/15/2022	N	Intermediate	PA-44i-031522	< 0.062 U	< 0.13 UJ	< 0.030 U	< 0.025 U	< 0.067 U	< 0.19 U	<b>0.28 j</b>	< 0.070 U	< 1.2 U	< 0.22 U
MWA-11i(d)	3/17/2022	N	Deep	MWA-11i(D)-031722	< 0.062 U	< 0.13 U	< 0.030 U	< 0.025 U	< 0.067 U	< 0.19 U	< 0.12 U	< 0.070 U	< 1.2 U	< 0.22 U
MWA-31i(d)	3/16/2022	N	Deep	MWA-31i(D)-031622	< 0.34 U	< 0.53 U	< 0.50 U	< 0.40 U	< 0.79 UJ	< 0.44 UJ	< 0.53 U	< 0.44 U	<b>1.4 J</b>	< 0.93 U
MWA-56d	3/17/2022	N	Deep	MWA-56D-031722	< 0.34 U	< 0.53 U	< 0.50 U	< 0.40 U	< 0.79 U	< 4.4 UJ	< 0.53 U	< 0.44 U	< 1.4 U	< 0.93 U
MWA-58d	3/17/2022	N	Deep	MWA-58D-031722	< 3.4 U	< 5.3 U	< 5.0 U	< 4.0 U	< 7.9 U	< 4.4 UJ	< 5.3 U	< 4.4 U	< 1.4 U	< 9.3 U
MWA-58d	3/17/2022	FD	Deep	DUP-02-031722	< 0.34 U	< 0.53 U	< 0.50 U	< 0.40 U	< 0.79 U	< 2.2 UJ	< 0.53 U	< 0.44 U	< 1.4 U	< 0.93 U
PA-19d	3/17/2022	N	Deep	PA-19D-031722	< 17 U	< 27 U	< 25 U	< 20 U	< 40 U	< 22 UJ	< 27 U	< 22 U	< 72 U	< 47 U
PA-20d	3/17/2022	N	Deep	PA-20D-031722	< 0.34 U	< 0.53 U	< 0.50 U	< 0.40 U	< 0.79 U	< 0.44 UJ	< 0.53 U	< 0.44 U	< 1.4 U	< 0.93 U
PA-21d	3/17/2022	N	Deep	PA-21D-031722	< 170 U	< 270 U	< 250 U	< 200 U	< 400 U	< 220 UJ	< 270 U	< 220 U	< 720 U	< 470 U
PA-22d	3/16/2022	N	Deep	PA-22D-031622	< 0.34 U	< 0.53 U	< 0.50 U	< 0.40 U	< 0.79 UJ	< 0.44 UJ	< 0.53 U	< 0.44 U	< 1.4 UJ	< 0.93 U
PA-23d	3/16/2022	N	Deep	PA-23D-031622	< 0.34 U	< 0.53 U	< 0.50 U	< 0.40 U	< 0.79 UJ	< 0.44 UJ	< 0.53 U	< 0.44 U	< 1.4 UJ	< 0.93 U
PA-24d	3/16/2022	N	Deep	PA-24D-031622	< 0.34 U	< 0.53 U	< 0.50 U	< 0.40 U	< 0.79 UJ	< 0.44 UJ	< 0.53 U	< 0.44 U	< 1.4 UJ	< 0.93 U
PA-25d	3/14/2022	N	Deep	PA-25D-031422	< 0.062 U	< 0.13 UJ	< 0.030 U	< 0.025 U	< 0.067 U	< 0.19 U	<b>0.28 j</b>	< 0.070 U	< 1.2 U	< 0.22 U
PA-26d	3/15/2022	N	Deep	PA-26D-031522	< 0.062 U	< 0.13 UJ	< 0.030 U	< 0.025 U	< 0.067 U	< 0.19 U	<b>0.28 j</b>	< 0.070 U	< 1.2 U	< 0.22 U
PA-27d	3/16/2022	N	Deep	PA-27D-031622	< 0.34 U	< 0.53 U	< 0.50 U	< 0.40 U	< 0.79 UJ	< 0.44 UJ	< 0.53 U	< 0.44 U	< 1.4 UJ	< 0.93 U
PA-30d	3/17/2022	N	Deep	PA-30D-031722	< 17 U	< 27 U	< 25 U	< 20 U	< 40 U	< 22 UJ	< 27 U	< 22 U	< 72 U	< 47 U

Notes:  
 Bolded values indicate concentrations above the Method Detection Limit.  
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 < = Compound not detected. Method Detection Limit shown.  
 µg/L = micrograms per liter  
 FD = Field Duplicate Sample  
 FSWP SHSC = Feasibility Study Work Plan Indirect Exposure Pathway Selected Hot Spot Criteria  
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 SW8260C analyses performed by TestAmerica - Seattle, WA of Seattle.

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**Table 2-1**  
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**Arkema Quarter 1, 2022, Groundwater Monitoring Report**  
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Analyte					n-Butylbenzene	n-Propylbenzene	o-Chlorotoluene (2-chlorotoluene)	o-Xylene	sec-Butylbenzene	Styrene	tert-Butylbenzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene
Unit					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
FSWP SHSC (shaded values indicate results above the value shown)					NE	NE	NE	13	NE	NE	NE	0.33	9.8	1,000
Location ID	Sample Date	Sample Type	Aquifer Classification	Sample ID										
MWA-41	3/14/2022	N	Shallow	MWA-41-031422	< 0.23 U	< 0.091 U	< 0.12 U	< 0.15 U	< 0.17 U	< 0.19 U	< 0.26 U	< 0.084 U	< 0.050 U	< 0.033 U
MWA-63	3/15/2022	N	Shallow	MWA-63-031522	< 4.4 UJ	< 5.0 UJ	< 5.1 UJ	< 3.9 UJ	< 4.9 UJ	< 5.3 UJ	< 5.8 UJ	<b>24 J</b>	< 3.9 UJ	< 3.9 UJ
MWA-82	3/14/2022	N	Shallow	MWA-82-031422	< 0.23 U	< 0.091 U	< 0.12 U	< 0.15 U	< 0.17 U	< 0.19 U	< 0.26 U	<b>0.62</b>	< 0.050 U	< 0.033 U
PA-03	3/16/2022	N	Shallow	PA-03-031622	< 0.23 U	< 0.091 U	< 0.12 U	<b>0.29 j</b>	< 0.17 U	<b>0.31 j</b>	< 0.26 U	< 0.084 U	<b>0.11 j</b>	< 0.033 U
PA-04	3/17/2022	N	Shallow	PA-04-031722	< 0.23 U	< 0.091 U	< 0.12 U	<b>0.29 j</b>	< 0.17 U	< 0.19 U	< 0.26 U	<b>0.18 j</b>	< 0.050 U	< 0.033 U
PA-08	3/14/2022	N	Shallow	PA-08-031422	< 0.23 U	< 0.091 U	< 0.12 U	< 0.15 U	< 0.17 U	< 0.19 U	< 0.26 U	<b>0.36</b>	< 0.050 U	< 0.033 U
PA-09	3/15/2022	N	Shallow	PA-09-031522	< 0.23 U	< 0.091 U	< 0.12 U	< 0.15 U	< 0.17 U	< 0.19 U	< 0.26 U	<b>0.29</b>	< 0.050 U	< 0.033 U
PA-31	3/15/2022	N	Shallow	PA-31-031522	< 0.23 U	< 0.091 U	< 0.12 U	< 0.15 U	<b>0.26 j</b>	< 0.19 U	< 0.26 U	<b>0.17 j</b>	< 0.050 U	< 0.033 U
PA-31	3/15/2022	FD	Shallow	DUP-01-031522	< 0.23 U	< 0.091 U	< 0.12 U	< 0.15 U	<b>0.26 j</b>	< 0.19 U	< 0.26 U	<b>0.19 j</b>	< 0.050 U	< 0.033 U
MWA-81i	3/14/2022	N	Intermediate	MWA-81i-031422	<b>0.29 j</b>	< 0.091 U	< 0.12 U	< 0.15 U	<b>0.27 j</b>	< 0.19 U	< 0.26 U	< 0.084 U	< 0.050 U	< 0.033 U
PA-10i	3/17/2022	N	Intermediate	PA-10i-031722	< 0.23 U	< 0.091 U	< 0.12 U	< 0.15 U	< 0.17 U	< 0.19 U	< 0.26 U	< 0.084 U	< 0.050 U	< 0.033 U
PA-15i	3/14/2022	N	Intermediate	PA-15i-031422	< 0.23 U	< 0.091 U	< 0.12 U	<b>0.29 j</b>	< 0.17 U	< 0.19 U	< 0.26 U	< 0.084 U	< 0.050 U	< 0.033 U
PA-16i	3/15/2022	N	Intermediate	PA-16i-031522	< 0.23 U	< 0.091 U	< 0.12 U	<b>0.28 j</b>	< 0.17 U	< 0.19 U	< 0.26 U	< 0.084 U	< 0.050 U	< 0.033 U
PA-17iR	3/16/2022	N	Intermediate	PA-17iR-031622	< 0.23 U	< 0.091 U	< 0.12 U	<b>0.29 j</b>	< 0.17 U	< 0.19 U	< 0.26 U	< 0.084 U	< 0.050 U	< 0.033 U
PA-32i	3/15/2022	N	Intermediate	PA-32i-031522	< 0.23 U	< 0.091 U	< 0.12 U	< 0.15 U	< 0.17 U	< 0.19 U	< 0.26 U	< 0.084 U	< 0.050 U	< 0.033 U
PA-44i	3/15/2022	N	Intermediate	PA-44i-031522	< 0.23 U	< 0.091 U	< 0.12 U	<b>0.28 j</b>	< 0.17 U	< 0.19 U	< 0.26 U	<b>0.26</b>	< 0.050 U	< 0.033 U
MWA-11i(d)	3/17/2022	N	Deep	MWA-11i(D)-031722	< 0.23 U	< 0.091 U	< 0.12 U	< 0.15 U	< 0.17 U	< 0.19 U	< 0.26 U	< 0.084 U	< 0.050 U	< 0.033 U
MWA-31i(d)	3/16/2022	N	Deep	MWA-31i(D)-031622	< 0.44 U	< 0.50 U	< 0.51 U	< 0.39 U	< 0.49 U	< 0.53 U	< 0.58 U	< 0.41 U	< 0.39 U	< 0.39 U
MWA-56d	3/17/2022	N	Deep	MWA-56D-031722	< 0.44 U	< 0.50 U	< 0.51 U	< 0.39 U	< 0.49 U	< 0.53 U	< 0.58 U	< 0.41 U	< 0.39 U	< 0.39 U
MWA-58d	3/17/2022	N	Deep	MWA-58D-031722	< 4.4 U	< 5.0 U	< 5.1 U	< 3.9 U	< 4.9 U	< 5.3 U	< 5.8 U	< 4.1 U	< 3.9 U	< 3.9 U
MWA-58d	3/17/2022	FD	Deep	DUP-02-031722	< 0.44 U	< 0.50 U	< 0.51 U	< 0.39 U	< 0.49 U	< 0.53 U	< 0.58 U	< 0.41 U	< 0.39 U	< 0.39 U
PA-19d	3/17/2022	N	Deep	PA-19D-031722	< 22 U	< 25 U	< 26 U	< 20 U	< 25 U	< 27 U	< 29 U	< 21 U	< 20 U	< 20 U
PA-20d	3/17/2022	N	Deep	PA-20D-031722	< 0.44 U	< 0.50 U	< 0.51 U	< 0.39 U	< 0.49 U	< 0.53 U	< 0.58 U	< 0.41 U	< 0.39 U	< 0.39 U
PA-21d	3/17/2022	N	Deep	PA-21D-031722	< 220 U	< 250 U	< 260 U	< 200 U	< 250 U	< 270 U	< 290 U	< 210 U	< 200 U	< 200 U
PA-22d	3/16/2022	N	Deep	PA-22D-031622	< 0.44 U	< 0.50 U	< 0.51 U	< 0.39 U	< 0.49 U	< 0.53 U	< 0.58 U	< 0.41 U	< 0.39 U	< 0.39 U
PA-23d	3/16/2022	N	Deep	PA-23D-031622	< 0.44 U	< 0.50 U	< 0.51 U	< 0.39 U	< 0.49 U	< 0.53 U	< 0.58 U	< 0.41 U	< 0.39 U	< 0.39 U
PA-24d	3/16/2022	N	Deep	PA-24D-031622	< 0.44 U	< 0.50 U	< 0.51 U	< 0.39 U	< 0.49 U	< 0.53 U	< 0.58 U	< 0.41 U	< 0.39 U	< 0.39 U
PA-25d	3/14/2022	N	Deep	PA-25D-031422	< 0.23 U	< 0.091 U	< 0.12 U	<b>0.29 j</b>	< 0.17 U	< 0.19 U	< 0.26 U	< 0.084 U	< 0.050 U	< 0.033 U
PA-26d	3/15/2022	N	Deep	PA-26D-031522	< 0.23 U	< 0.091 U	< 0.12 U	<b>0.29 j</b>	< 0.17 U	< 0.19 U	< 0.26 U	< 0.084 U	< 0.050 U	< 0.033 U
PA-27d	3/16/2022	N	Deep	PA-27D-031622	< 0.44 U	< 0.50 U	< 0.51 U	< 0.39 U	< 0.49 U	< 0.53 U	< 0.58 U	< 0.41 U	< 0.39 U	< 0.39 U
PA-30d	3/17/2022	N	Deep	PA-30D-031722	< 22 U	< 25 U	< 26 U	< 20 U	< 25 U	< 27 U	< 29 U	< 21 U	< 20 U	< 20 U

Notes:  
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 Shaded values indicate concentrations above the FSWP SHSC.  
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 µg/L = micrograms per liter  
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 FSWP SHSC = Feasibility Study Work Plan Indirect Exposure Pathway Selected Hot Spot Criteria  
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**Portland, Oregon**

Analyte					trans-1,3-Dichloropropene	Trichloroethene	Trichlorofluoromethane (Freon 11)	Vinyl chloride
Unit					µg/L	µg/L	µg/L	µg/L
FSWP SHSC (shaded values indicate results above the value shown)					NE	3	NE	0.24
Location ID	Sample Date	Sample Type	Aquifer Classification	Sample ID				
MWA-41	3/14/2022	N	Shallow	MWA-41-031422	< 0.092 U	< 0.066 U	< 0.12 UJ	< 0.013 U
MWA-63	3/15/2022	N	Shallow	MWA-63-031522	<b>4.8 J</b>	<b>6.7 J</b>	< 3.6 UJ	< 2.2 UJ
MWA-82	3/14/2022	N	Shallow	MWA-82-031422	< 0.092 U	< 0.066 U	< 0.12 UJ	< 0.013 U
PA-03	3/16/2022	N	Shallow	PA-03-031622	< 0.092 U	< 0.066 U	< 0.12 UJ	< 0.013 U
PA-04	3/17/2022	N	Shallow	PA-04-031722	< 0.092 U	< 0.066 U	< 0.12 UJ	< 0.013 U
PA-08	3/14/2022	N	Shallow	PA-08-031422	< 0.092 U	<b>0.21</b>	< 0.12 UJ	< 0.013 U
PA-09	3/15/2022	N	Shallow	PA-09-031522	< 0.092 U	< 0.066 U	< 0.12 UJ	< 0.013 U
PA-31	3/15/2022	N	Shallow	PA-31-031522	< 0.092 U	< 0.066 U	<b>0.14 J</b>	< 0.013 U
PA-31	3/15/2022	FD	Shallow	DUP-01-031522	< 0.092 U	< 0.066 U	<b>0.13 J</b>	< 0.013 U
MWA-81i	3/14/2022	N	Intermediate	MWA-81i-031422	< 0.092 U	< 0.066 U	< 0.12 UJ	< 0.013 U
PA-10i	3/17/2022	N	Intermediate	PA-10i-031722	< 0.092 U	< 0.066 U	< 0.12 U	<b>0.061</b>
PA-15i	3/14/2022	N	Intermediate	PA-15i-031422	< 0.092 U	< 0.066 U	< 0.12 UJ	< 0.013 U
PA-16i	3/15/2022	N	Intermediate	PA-16i-031522	< 0.092 U	< 0.066 U	< 0.12 UJ	< 0.013 U
PA-17iR	3/16/2022	N	Intermediate	PA-17iR-031622	< 0.092 U	< 0.066 U	< 0.12 UJ	<b>0.13</b>
PA-32i	3/15/2022	N	Intermediate	PA-32i-031522	< 0.092 U	< 0.066 U	< 0.12 UJ	<b>0.14</b>
PA-44i	3/15/2022	N	Intermediate	PA-44i-031522	< 0.092 U	<b>0.083 j</b>	< 0.12 UJ	< 0.013 U
MWA-11i(d)	3/17/2022	N	Deep	MWA-11i(D)-031722	< 0.092 U	< 0.066 U	< 0.12 U	< 0.013 U
MWA-31i(d)	3/16/2022	N	Deep	MWA-31i(D)-031622	< 0.41 U	<b>0.48 J</b>	< 0.36 U	< 0.22 U
MWA-56d	3/17/2022	N	Deep	MWA-56D-031722	< 0.41 U	< 0.26 U	< 0.36 U	< 0.22 U
MWA-58d	3/17/2022	N	Deep	MWA-58D-031722	< 4.1 U	< 2.6 U	< 3.6 U	< 2.2 U
MWA-58d	3/17/2022	FD	Deep	DUP-02-031722	< 0.41 U	< 0.26 U	< 0.36 U	< 0.22 U
PA-19d	3/17/2022	N	Deep	PA-19D-031722	< 21 U	< 13 U	< 18 U	< 11 U
PA-20d	3/17/2022	N	Deep	PA-20D-031722	< 0.41 U	< 0.26 U	< 0.36 U	< 0.22 U
PA-21d	3/17/2022	N	Deep	PA-21D-031722	< 210 U	< 130 U	< 180 U	< 110 U
PA-22d	3/16/2022	N	Deep	PA-22D-031622	< 0.41 U	<b>0.55 J</b>	< 0.36 U	< 0.22 U
PA-23d	3/16/2022	N	Deep	PA-23D-031622	< 0.41 U	< 0.26 U	< 0.36 U	< 0.22 U
PA-24d	3/16/2022	N	Deep	PA-24D-031622	< 0.41 U	< 0.26 U	< 0.36 U	< 0.22 U
PA-25d	3/14/2022	N	Deep	PA-25D-031422	< 0.092 U	< 0.066 U	< 0.12 UJ	< 0.013 U
PA-26d	3/15/2022	N	Deep	PA-26D-031522	< 0.092 U	< 0.066 U	< 0.12 UJ	< 0.013 U
PA-27d	3/16/2022	N	Deep	PA-27D-031622	< 0.41 U	< 0.26 U	< 0.36 U	< 0.22 U
PA-30d	3/17/2022	N	Deep	PA-30D-031722	< 21 U	< 13 U	< 18 U	< 11 U

Notes:  
 Bolded values indicate concentrations above the Method Detection Limit.  
 Shaded values indicate concentrations above the FSWP SHSC.  
 < = Compound not detected. Method Detection Limit shown.  
 µg/L = micrograms per liter  
 FD = Field Duplicate Sample  
 FSWP SHSC = Feasibility Study Work Plan Indirect Exposure Pathway Selected Hot Spot Criteria  
 N = Normal Environmental Sample  
 NE = Not Established  
 SW8260C analyses performed by TestAmerica - Seattle, WA of Seattle.

Qualifiers - Organic:  
 j = The analyte was positively identified below the RDL; associated numerical value is the approximate concentration of the analyte in the sample.  
 J = The concentration of the sample is considered to be an estimate with no bias, as the associated QC results were outside the control limits.  
 J+ = The concentration of the sample is considered to be biased high, as the associated QC results exceed the upper control limits.  
 U = Analyte was analyzed for, but not detected above, the limit displayed.  
 UJ = Analyte was analyzed for, but not detected. The detection limit is a quantitative estimate.

**Table 2-2**  
**Additional Compounds Results**  
**Arkema Quarter 1, 2022, Groundwater Monitoring Report**  
**Arkema Inc. Facility**  
**Portland, Oregon**

Analyte Unit					Chloride mg/L	Perchlorate µg/L
FSWP SHSC (shaded values indicate results above the value shown)					230	1,800
Location ID	Sample Date	Sample Type	Aquifer Classification	Sample ID		
MWA-41	3/14/2022	N	Shallow	MWA-41-031422	14 J-	< 2.0 U
MWA-63	3/15/2022	N	Shallow	MWA-63-031522	5.5 J-	< 2.0 U
MWA-82	3/14/2022	N	Shallow	MWA-82-031422	11 J-	52
PA-03	3/16/2022	N	Shallow	PA-03-031622	7.3	< 20 U
PA-04	3/17/2022	N	Shallow	PA-04-031722	6.5	< 2.0 U
PA-08	3/14/2022	N	Shallow	PA-08-031422	250 J-	< 20 U
PA-09	3/15/2022	N	Shallow	PA-09-031522	24 J-	20
PA-31	3/15/2022	N	Shallow	PA-31-031522	4.5 J-	< 10 U
PA-31	3/15/2022	FD	Shallow	DUP-01-031522	4.5 J-	< 10 U
MWA-81i	3/14/2022	N	Intermediate	MWA-81I-031422	14 J-	< 2.0 U
PA-10i	3/17/2022	N	Intermediate	PA-10I-031722	90	< 20 U
PA-15i	3/14/2022	N	Intermediate	PA-15I-031422	250 J-	< 20 U
PA-16i	3/15/2022	N	Intermediate	PA-16I-031522	110 J-	< 10 U
PA-17iR	3/16/2022	N	Intermediate	PA-17IR-031622	23	< 20 U
PA-32i	3/15/2022	N	Intermediate	PA-32I-031522	89 J-	< 20 U
PA-44i	3/15/2022	N	Intermediate	PA-44I-031522	23 J-	270
MWA-11i(d)	3/17/2022	N	Deep	MWA-11I(D)-031722	2,200	< 20 U
MWA-31i(d)	3/16/2022	N	Deep	MWA-31I(D)-031622	20,000	97,000
MWA-56d	3/17/2022	N	Deep	MWA-56D-031722	19,000	9,200
MWA-58d	3/17/2022	N	Deep	MWA-58D-031722	26,000	44,000
MWA-58d	3/17/2022	FD	Deep	DUP-02-031722	26,000	57,000
PA-19d	3/17/2022	N	Deep	PA-19D-031722	340	< 20 U
PA-20d	3/17/2022	N	Deep	PA-20D-031722	1,200	140
PA-21d	3/17/2022	N	Deep	PA-21D-031722	360	1,100
PA-22d	3/16/2022	N	Deep	PA-22D-031622	8,000	23,000
PA-23d	3/16/2022	N	Deep	PA-23D-031622	89	< 2.0 U
PA-24d	3/16/2022	N	Deep	PA-24D-031622	38,000	< 200 U
PA-25d	3/14/2022	N	Deep	PA-25D-031422	18 J-	< 2.0 U
PA-26d	3/15/2022	N	Deep	PA-26D-031522	72 J-	< 2.0 U
PA-27d	3/16/2022	N	Deep	PA-27D-031622	1,000	< 20 U
PA-30d	3/17/2022	N	Deep	PA-30D-031722	490	< 20 U

**Notes:**

< = compound not detected; reportable detection limit shown

Empty cells = not analyzed

NS = no standard

µg/L = micrograms per liter

mg/L = milligrams per liter

Bolded values indicate concentrations above the Reportable Detection Limit.

Shaded values indicate concentrations above the standard.

FD = Field Duplicate Sample

N = Normal Environmental Sample

E300 analyses performed by TestAmerica - Seattle, WA of Seattle.

E314.0 analyses performed by TestAmerica - Sacramento, CA of West Sacramento.

**Qualifiers - Organic:**

J- = The concentration of the sample is considered to be biased low, as the associated QC results are outside the lower control limits.

U = Analyte was analyzed for, but not detected above, the limit displayed.